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CHAPTER 2

Cisco Nexus 5000 Series Overview

This chapter describes the Cisco Nexus 5000 series switches. This chapter includes the following sections:

- Cisco Nexus 5020 Switch, page 2-1
- Cisco Nexus 5010 Switch, page 2-17

Cisco Nexus 5020 Switch

This section describes the Cisco Nexus 5020 switches. This section includes the following sections:

- Features, page 2-1
- Chassis, page 2-2
- Ports, page 2-9
- Expansion Modules, page 2-5
- Power Supply, page 2-11
- Fan Modules, page 2-12
- LED Descriptions, page 2-14
- Supported SFP Transceivers, page 2-16

Features

The Cisco Nexus 5020 switch is a 2 RU, top-of-rack switch that provides Ethernet and Fibre Channel consolidation in a single physical cable. The Fibre Channel over Ethernet (FCoE) protocol is used to consolidate Ethernet and Fibre Channel traffic onto the same physical connection between the server and the switch. As a top-of-rack switch, all the servers in the rack connect to the Cisco Nexus 5020 switch, and it connects to the LAN or SAN.

The Cisco Nexus 5020 switch is a part of a family of switches that provide 10-Gigabit Ethernet and FCoE ports and both 10-Gigabit Ethernet and native 1-, 2-, and 4-Gbps Fibre Channel ports. The switches provide consolidated I/O connectivity to both production Ethernet LANs and Fibre Channel SANs in a cost-effective, high-performance, low-latency Ethernet switch.

The Cisco Nexus 5020 switch has the following features:

- Forty fixed 10-Gigabit Ethernet server connection ports on the back of the switch

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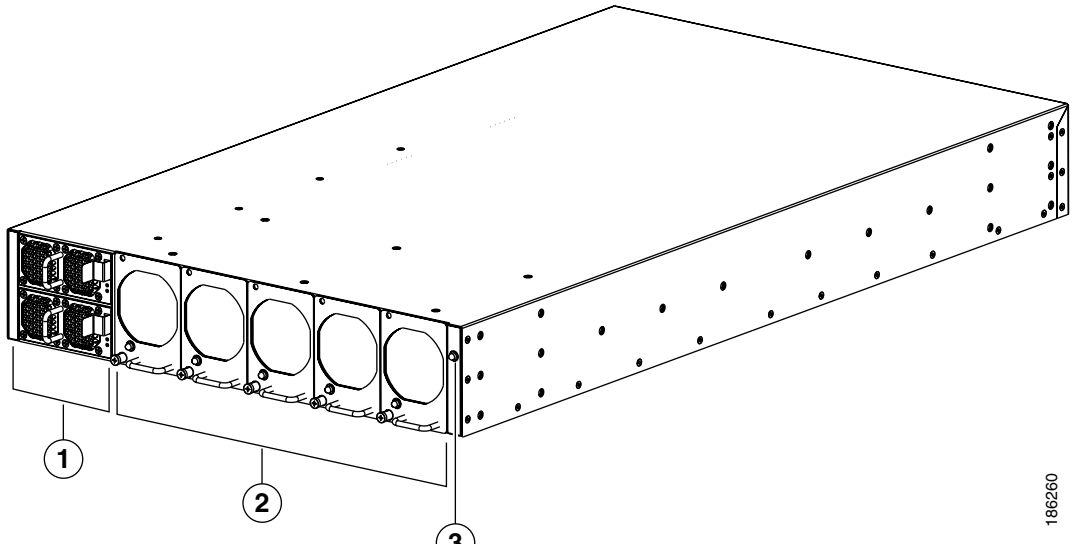
- Two slots for optional 10-Gigabit expansion modules or Fibre Channel interfaces on the back of the switch
- Two slots on the front of the switch for hot swap-capable power supplies
- Five slots on the front of the switch for hot swap-capable fan modules, each of which houses two fans, that provide front-to-back cooling for the switch

Chassis

The Cisco Nexus 5020 chassis is 2 RU (3.47 inches) tall, 17.3 inches wide, and 30.0 inches deep. It is designed to be mounted in a standard 19-inch rack. The switch has two power supplies and five fans modules on the front of the switch. Ports are at the rear of the switch. The airflow is front to back. Figure 2-1 shows the front of the Cisco Nexus 5020 switch.

Figure 2-1 Cisco Nexus 5020 Switch Front View



1	Two power supplies	2	Five fan modules

Figure 2-2 shows a close-up view of the front of the switch.

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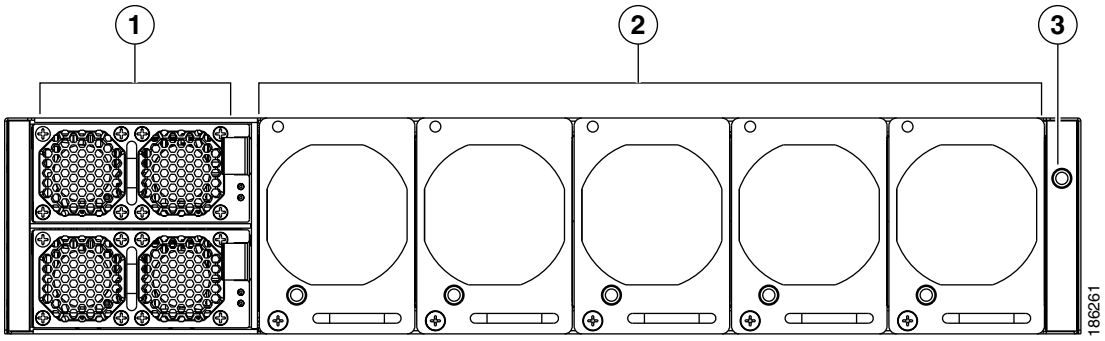
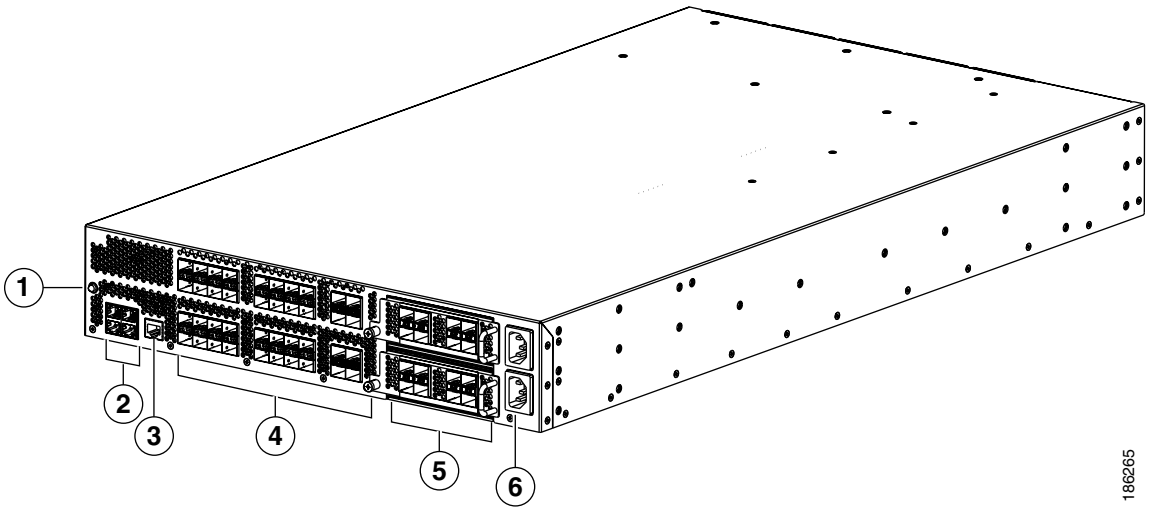
Figure 2-2 Cisco Nexus 5020 Switch Front View Close-up



1	Two power supplies	3	System status LED
2	Five fan modules		

The rear of the Cisco Nexus 5020 chassis has 40 fixed 10-Gigabit Ethernet ports, 2 slots for optional expansion modules, an Ethernet connector with 2 cross-connect ports and 2 management ports, a console port, and 2 AC power connectors. Figure 2-3 shows the rear of the Cisco Nexus 5020 switch.

Figure 2-3 Cisco Nexus 5020 Switch Rear View



1	System status LED	4	40 fixed 10-Gigabit Ethernet ports
2	Ethernet connector with two cross-connect ports on the left (top and bottom), and two network management ports on the right (top and bottom)	5	Expansion modules, shown here with two 4-port Fibre Channel plus 4-port 10-Gigabit Ethernet expansion modules
3	Console port	6	AC power connectors

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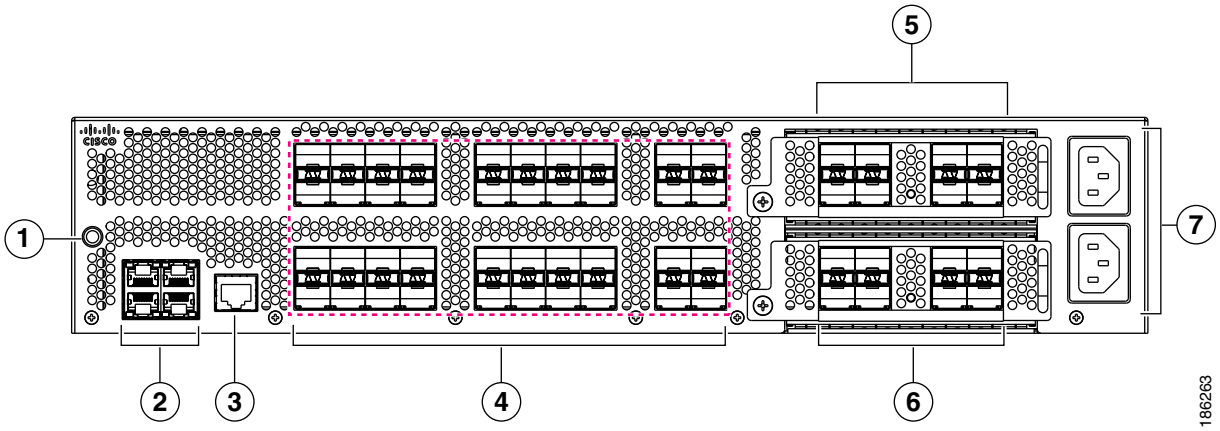
Figure 2-4 shows a close-up view of the rear of the Cisco Nexus 5020 chassis.

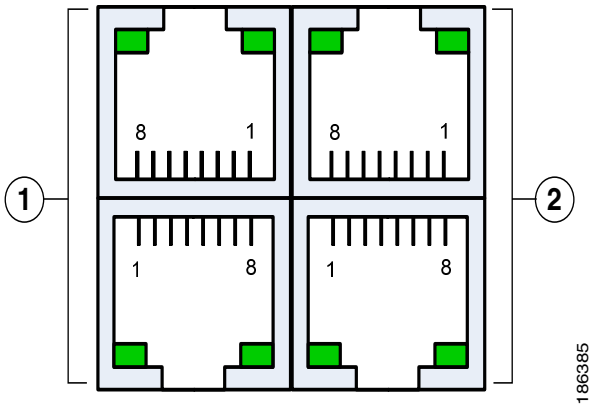
Figure 2-4 Cisco Nexus 5020 Switch Rear View Close-up



1	System status LED	4	Slot 1, with 40 fixed 10-Gigabit Ethernet ports (highlighted in red).
2	Ethernet connector with two cross-connect ports on left side, and two network management1 (top) and management2 (bottom) ports on the right side	5	Slot 2 for an optional expansion module; shown here with a 4-port Fibre Channel plus 4-port 10-Gigabit Ethernet expansion module
3	Console port	6	Slot 3 for an optional expansion module; shown here with a 4-port Fibre Channel plus 4-port 10-Gigabit Ethernet expansion module

The Ethernet connector port exposes four Ethernet ports that are in a 2x2 stacked RJ-45 jack. Figure 2-5 shows a close-up view of the Ethernet connector port.

Figure 2-5 Ethernet Connector Port



1	Internal cross connect ports	2	Network management ports

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Table 2-1 lists the LED descriptions for all Ethernet LEDs.

Table 2-1 Ethernet LED Descriptions

LED	Status	Description
Left	Off	No link
	Solid green	Physical link
Right	Off	No activity
	Blinking green	Activity

Expansion Modules

Expansion modules allow Cisco Nexus 5000 switches to be configured as cost-effective 10-Gigabit Ethernet switches and as I/O consolidation platforms with native Fibre Channel connectivity. The Cisco Nexus 5020 switch has two slots that can be used for the following optional expansion modules:

- Fibre Channel plus Ethernet expansion module with four 10-Gigabit Ethernet Cisco Data Center Ethernet and FCoE ports and four 1-, 2-, and 4-Gbps Fibre Channel ports
- Ethernet expansion module with six ports of 10-Gigabit Ethernet Cisco Data Center Ethernet and FCoE

The chassis supports hot swapping of the expansion modules

This section includes the following topics:

- Fibre Channel Plus Ethernet Expansion Module, page 2-5
- Ethernet Expansion Module, page 2-7
- N5K-M1008 Gatos Expansion Module, page 2-7
- N5K-M1060 Gatos Expansion Module, page 2-8

Fibre Channel Plus Ethernet Expansion Module

The Fibre Channel plus Ethernet expansion module supports four SFP+ transceiver modules and four 1-, 2-, 4-Gbps Fibre Channel transceivers. The Fibre Channel plus Ethernet expansion module is a field-replaceable unit (FRU). Figure 2-6 shows the Fibre Channel plus Ethernet expansion module.

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Figure 2-6 Fibre Channel Plus Ethernet Expansion Module

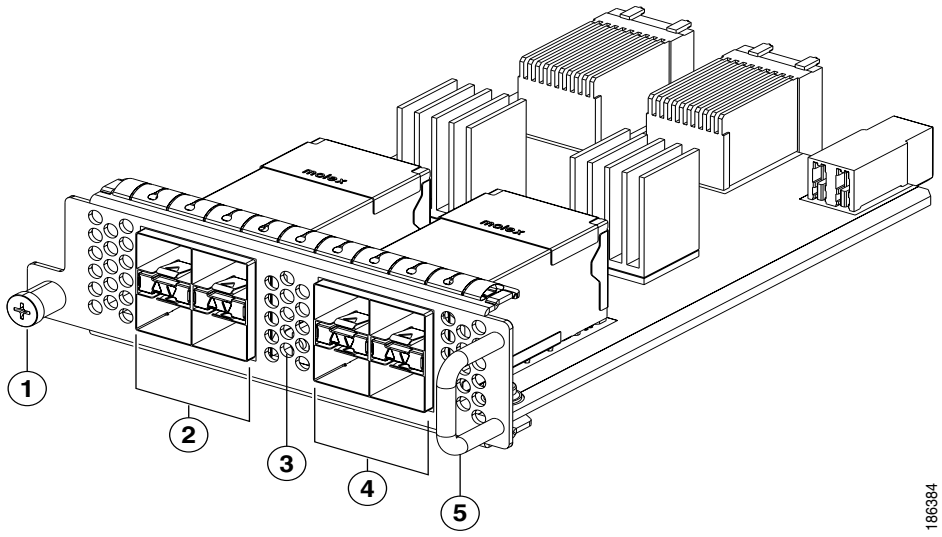
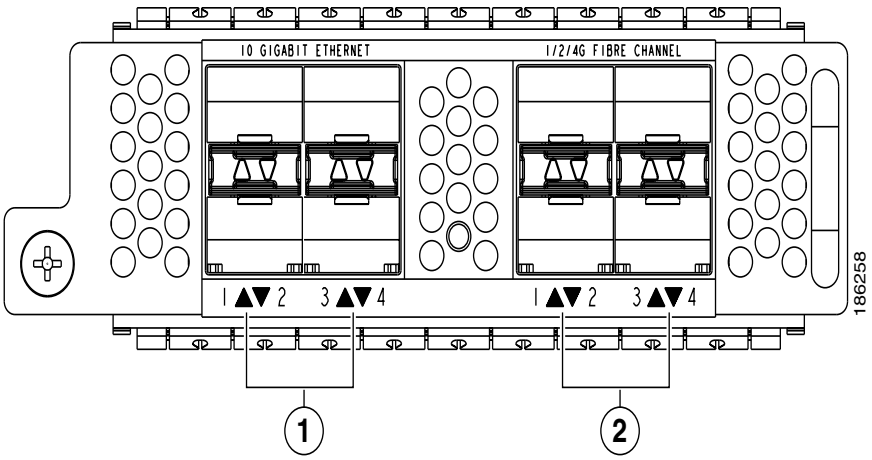


Figure 2-7 shows the front of the Fibre Channel plus Ethernet expansion module. Figure 2-13 shows how ports are numbered on the Fibre Channel plus Ethernet expansion module.

Figure 2-7 Front View of the Fibre Channel Plus Ethernet Expansion Module f



1	Four 10-Gigabit Ethernet ports	**3**	Four 1-, 2-, 4-Gbps Fibre Channel ports
2	Module LED		

See Figure 2-13 for an illustration of how ports are grouped and numbered on the Fibre Channel plus Ethernet expansion module.

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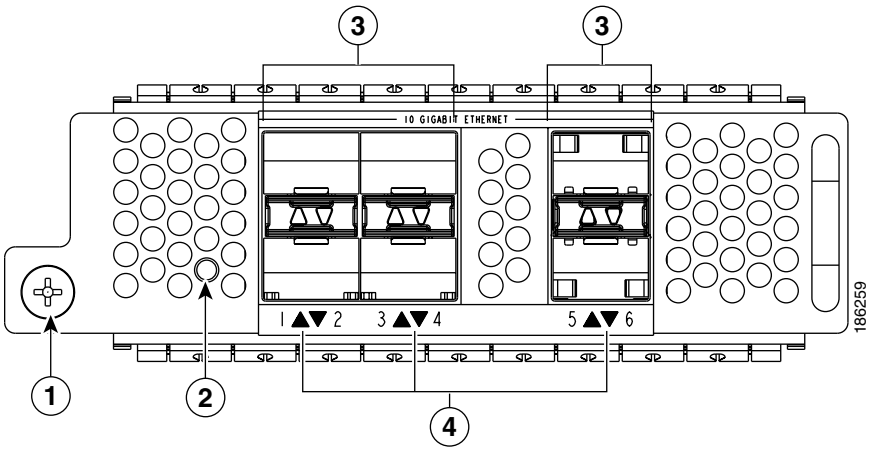
Ethernet Expansion Module

The Ethernet expansion module supports six 10-Gigabit Ethernet ports, four of which will have encryption capability. The Ethernet expansion module is a field-replaceable unit (FRU). Figure 2-8 shows the Ethernet expansion module.

Figure 2-8 Ethernet Expansion Module



1	10-Gigabit Ethernet ports	**3**	10-Gigabit Ethernet ports
2	Module LED		

See Figure 2-14 for an illustration of how ports are grouped and numbered on the Ethernet expansion module.

N5K-M1008 Gatos Expansion Module

The N5K-M1008 GEM supports 8 1/2/4G Fiber Channel, SFP-based uplink connection. Figure 2-9 shows the N5K-M1008 GEM.

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Figure 2-9 N5K-M1008 GEM

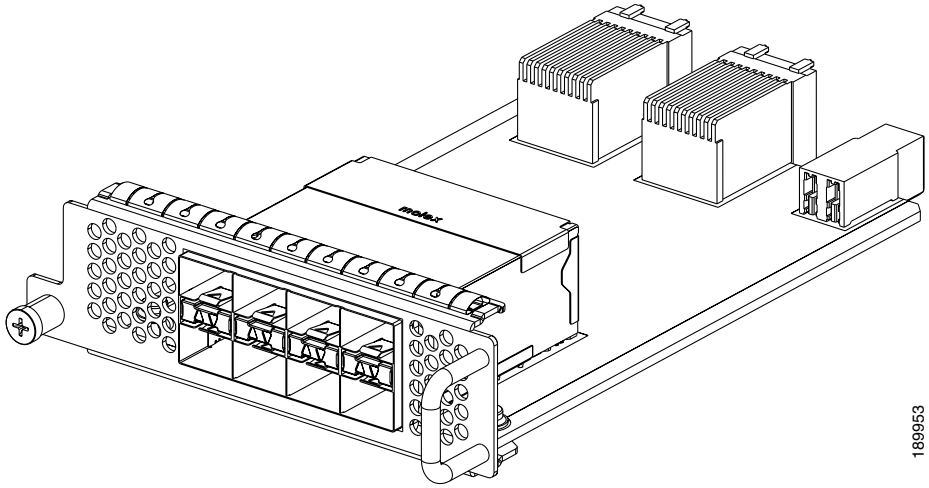
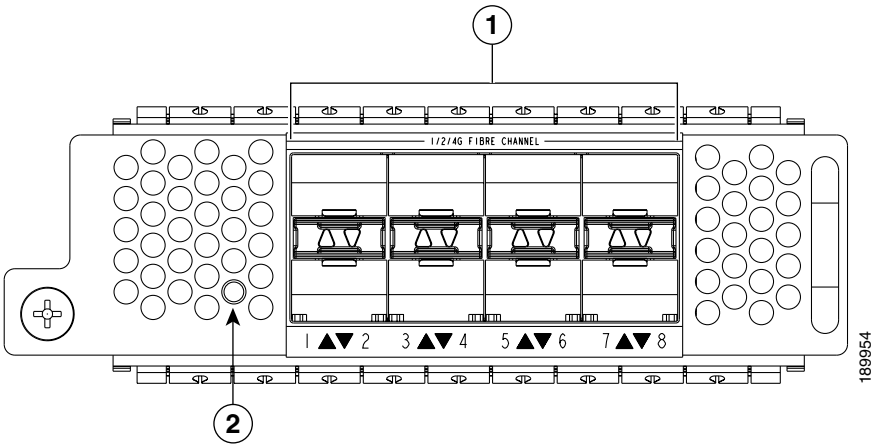


Figure 2-10 Front View of the N5K-M1008 GEM



1	Eight 1-, 2-, 4-Gbps Fibre Channel ports	**2**	LED

N5K-M1060 Gatos Expansion Module

The N5K-M1060 xpansion module provides 6 EA 1/2/4/8G line rate Fiber Channel, SFP+ based uplink connections. Figure 2-11 and Figure 2-12 show the N5K-M1060 GEM.

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Figure 2-11 N5K-M1060 GEM

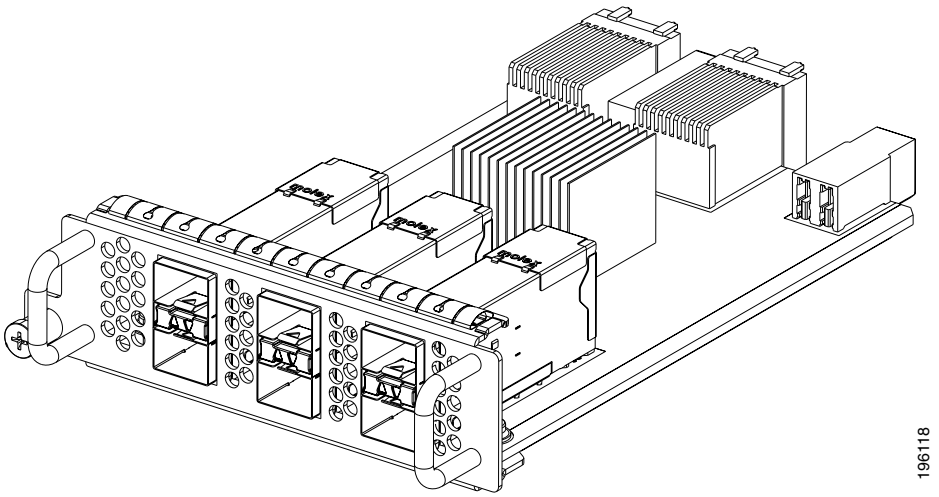
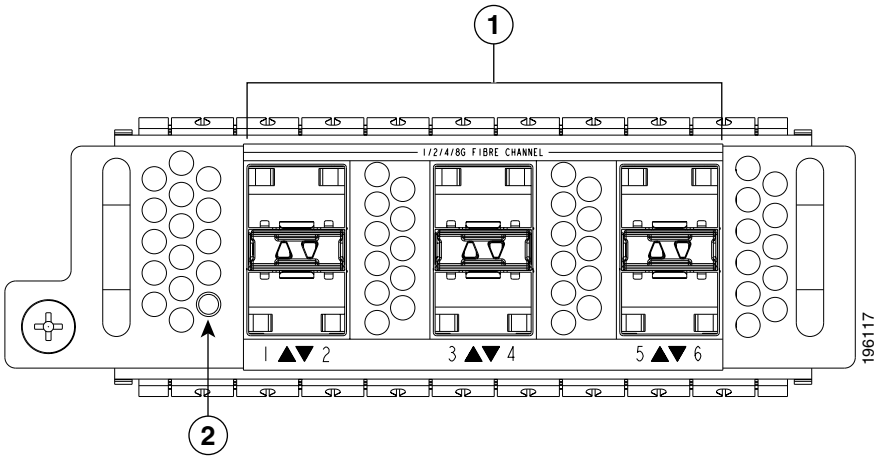


Figure 2-12 Front View of the N5K-M1060 GEM



1	Six 1-, 2-, 4-, 8-Gbps Fibre Channel ports	**2**	LED

Ports

Each individual port on the Cisco Nexus 5020 switch is numbered, and groups of ports are numbered based on their function. The ports are numbered top to bottom and left to right. The 40 fixed ports form group 1 and are named 1/*port_number*. Ports 1 through 32 are unencrypted Ethernet ports. Of these, ports 1 through 16 are 10-Gigabit Ethernet and 1-Gigabit Ethernet capable ports. Ports 33 through 40 are encryption-capable Ethernet ports.

Group 2 includes the ports in the top-most expansion module. Group 2, ports 1 through 4, are encrypted Ethernet ports. Group 2, ports 5 through 8, are Fibre Channel ports.

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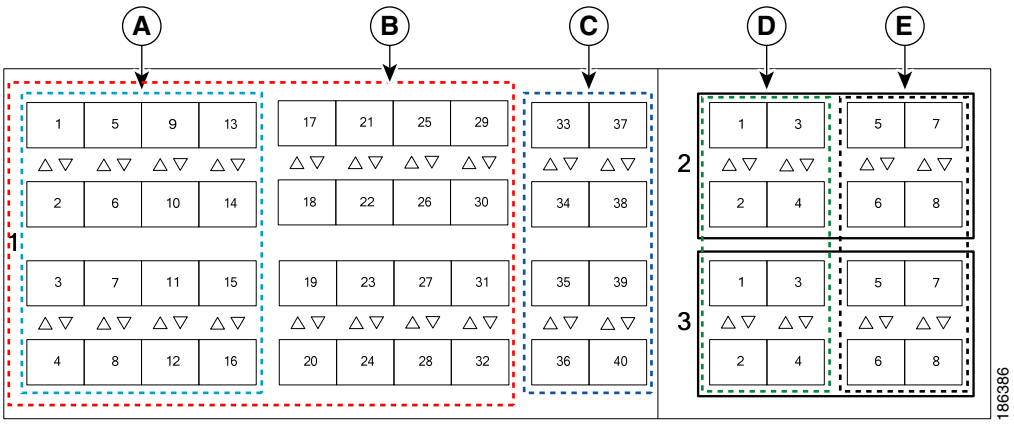
Group 3 includes the ports in the bottom-most expansion module. Group 3 ports 1 through 4 are encrypted Ethernet ports. Group 3 ports 5 through 8 are Fibre Channel ports.

Figure 2-13 shows how ports are numbered and grouped by function for both the fixed ports and the Fibre Channel plus Ethernet expansion module ports.

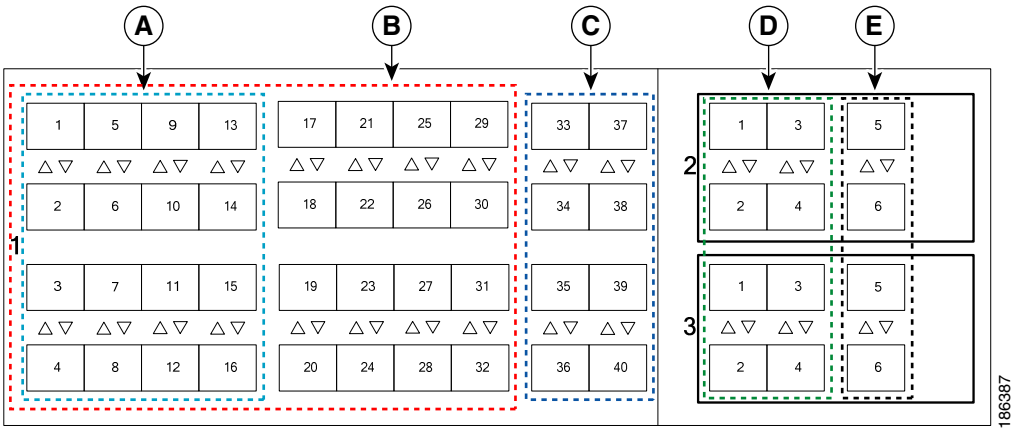
Figure 2-13 Port Numbering of Fixed Ports and Fibre Channel Plus Ethernet Expansion Module Ports



A	Group 1, ports 1 through 16: 10-Gigabit Ethernet and 1-Gigabit Ethernet capable unencrypted ports	**D**	Groups 2 and 3, ports 1 through 4: Encrypted Ethernet ports
B	Group 1, ports 1 through 32: Unencrypted Ethernet ports	**E**	Groups 2 and 3, ports 5 through 8: Fibre Channel ports
C	Group 1, ports 33 through 40: Encrypted Ethernet ports		

Figure 2-14 shows how ports are numbered and grouped by function for both the fixed ports and the Ethernet expansion module ports.

Figure 2-14 Port Numbering of Fixed Ports and the Ethernet Expansion Module



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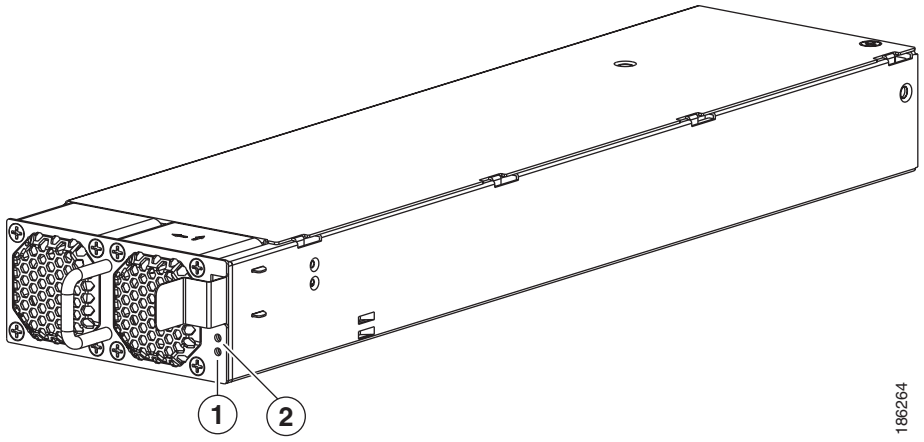
A	Group 1, ports 1 through 16: 10-Gigabit Ethernet and 1-Gigabit Ethernet capable Encrypted ports	**D**	Groups 2 and 3, ports 1 through 4: Encrypted Ethernet ports
B	Group 1, ports 1 through 32: Unencrypted Ethernet ports	**E**	Groups 2 and 3, ports 5 through 6: Unencrypted Ethernet ports
C	Group 1, ports 33 through 40: Encrypted Ethernet ports		

Power Supply

The Cisco Nexus 5020 switch uses a front-end power supply. The chassis has slots for two power supplies. Two power supplies can be used for redundancy, but the Cisco Nexus 5020 switch is fully functional with one power supply. Figure 2-15 shows the power supply, which has two LEDs: one for the power status and one for the failure condition.

Figure 2-15 Power Supply for the Cisco Nexus 5020 Switch



1	Green power LED indicates the power status.	**2**	Amber fail LED indicates a failure condition.

Table 2-2 table describes the status of the two power supply LEDs.

Table 2-2 Power Supply LED Descriptions

Power Supply Condition	Power LED Status	Fail LED Status
No AC power to all power supplies.	Off	Off
Power supply failure, including overvoltage, overcurrent, overtemperature, and fan failure.	Off	On
Power supply warning events where the power supply continues to operate. These events include high temperature, high power, and slow fan.	Off	Blinking

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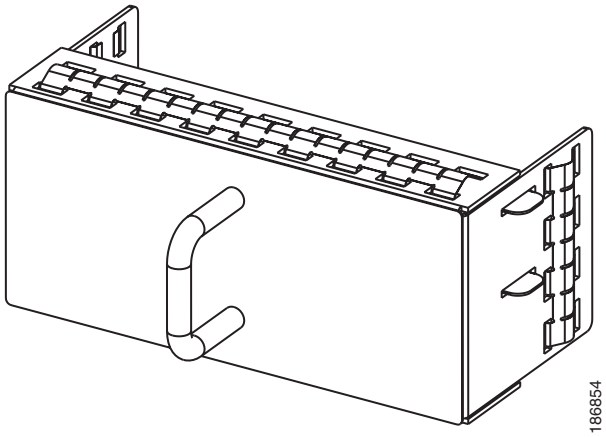
Table 2-2 Power Supply LED Descriptions (continued)

Power Supply Condition	Power LED Status	Fail LED Status
AC present, 3.3 voltage standby (VSB) on, and the power supply unit is off.	1 Hz blinking	Off
Power supply on and OK.	On	Off

If you have one power supply installed in the chassis, but the other power supply slot is empty, you should use a blank filler panel to cover the empty slot. Figure 2-16 shows a blank power supply filler panel.

Figure 2-16 Blank Power Supply Filler Panele



Fan Modules

The Cisco Nexus 5020 switch has five fan modules. Figure 2-17 shows the fan module.

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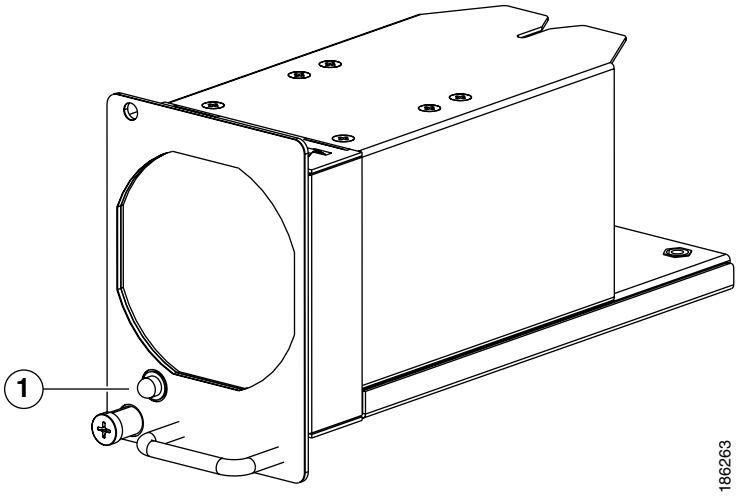
Figure 2-17 Cisco Nexus 5020 Fan Module



1	Fan module LED		

The bicolor fan module LED indicates the fan tray health. Green indicates normal operation, while amber indicates a fan failure.

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LED Descriptions

Table 2-3 describes the LEDs for the Cisco Nexus 5020 switch.

Table 2-3 LEDs for the Cisco Nexus 5020 Switch

LED	Location	Function	Color	Status	Description
Chassis	Front and back of chassis	Chassis power and health	Green	Solid on	All diagnostics pass. The module is operational.
				Off	The module is not receiving power.
			Amber	On	The module is booting or running diagnostics. An overtemperature condition has occurred. The temperature threshold has been exceeded by a small value during environmental monitoring.
				Blinking	An overtemperature condition has occurred. The temperature threshold has been exceeded by a large value during environmental monitoring. If the module fails during an initial reset, the LED continues to blink and the module does not come online. The module has a runtime failure and is brought offline.
Fan module	Fan modules (front)	Fan module health indicator	Green	Solid on	All diagnostics pass. The module is operational.
				Off	The module is not receiving power.
			Amber	Solid on	The module is booting or running diagnostics.
			Amber	Blinking	If the module fails during an initial reset, the LED continues to blink and the module does not come online. The module has a runtime failure and is brought offline.

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Table 2-3 LEDs for the Cisco Nexus 5020 Switch (continued)

LED	Location	Function	Color	Status	Description
Power supply	Power supply (front)	Power supply health	Green	Solid on	Power supply is on and okay.
				Off	No AC power to the power supply.
			Amber	Solid on	Power supply failures, over voltage, over current, over temperature.
				Blinking	AC is present, 3.3 VSB on, and the power supply is off.
				Off	Operating normally.
Module	Back of chassis	Indicator of a fault with any expansion module	Green	On	All diagnostics pass. The module is operational.
				Off	The module is not receiving power.
			Amber	Solid on	The module is booting or running diagnostics. An overtemperature condition has occurred. The temperature threshold has been exceeded by a small value during environmental monitoring.
				Blinking	An overtemperature condition has occurred. The temperature threshold has been exceeded by a large value during environmental monitoring. If the module fails during an initial reset, the LED continues to blink and the module does not come online. The module has a runtime failure and is brought offline
Port LED	Back of the chassis	Indicates LED status	Green	Off	The port is not active or the link is not connected.
				Solid on	The port is active. The link is connected and operational.
			Amber	Solid on	The module or port is disabled through the CLI command or the module is initializing.
				Blinking	The port is faulty and has been disabled.

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Supported SFP Transceivers

The Cisco Nexus 5020 switch supports both SFP+ Ethernet transceivers and SFP Fibre Channel transceivers.

This section includes the following sections:

- SFP+ Transceivers, page 2-16
- SFP+ Copper Cables, page 2-16
- SFP Fiber Channel Transceivers, page 2-17

SFP+ Transceivers

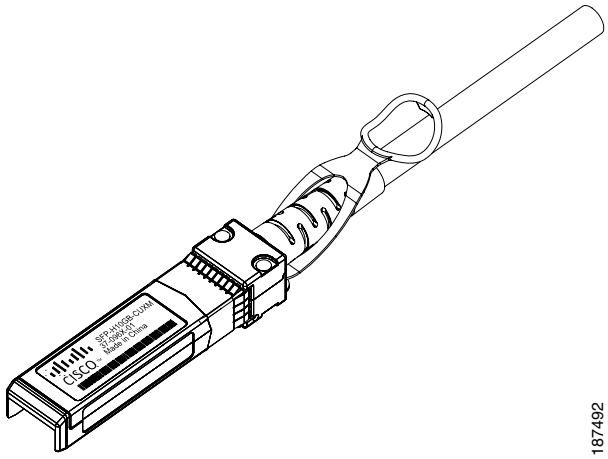
The enhanced Small-Form-Factor Pluggable (SFP+) 10-Gigabit Ethernet transceiver module is a bidirectional device with a transmitter and receiver in the same physical package. SeeTable 2-4 . It has a 20-pin connector on the electrical interface and duplex LC connector on the optical interface.The Cisco Nexus 5020 switch supports the SFP-10G-SR transceiver.

Table 2-4 SFP+ Transceivers

Model	Description
SFP-10G-SR	10-Gigabit Ethernet—short range SFP+ module

Figure 2-18 shows the SFP-10G-SR transceiver.

Figure 2-18 SFP+ 10-Gigabit Ethernet Transceiver Module



SFP+ Copper Cables

Copper cables are available for use with the 10-Gigabit Ethernet SFP+ module. See Table 2-5. The cables come in the following lengths:

- 1m, 30AWG
- 3m, 28-30 AWG

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- 5m, 26-28 AWG

Table 2-5 SFP+ Copper Cables

Model	Description
SFP-H10GB-CU1M	10GBASE-CU SFP+ Cable 1 Meter
SFP-H10GB-CU3M	10GBASE-CU SFP+ Cable 3 Meter
SFP-H10GB-CU5M	10GBASE-CU SFP+ Cable 5 Meter

SFP Fiber Channel Transceivers

The Cisco Nexus 5020 switch also supports the following SFP Fibre Channel transceivers (See Table 2-6) :

Table 2-6 SFP Fiber Channel Transceivers

Model	Description
DS-SFP-FC4G-SW	4-Gbps/2-Gbps/1-Gbps Fibre Channel—short wavelength SFP module

Cisco Nexus 5010 Switch

This section describes the Cisco Nexus 5010 switch and its components. This section includes the following topics:

- Features, page 2-18
- Chassis, page 2-18
- Expansion Modules, page 2-22
- Ports, page 2-26
- Power Supplies, page 2-28
- Fan Modules, page 2-29
- LED Descriptions, page 2-30
- Supported SFP Transceivers, page 2-31

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Features

The Cisco Nexus 5010 switch is a 1RU, top-of-rack switch that provides Ethernet and Fibre Channel consolidation in a single physical cable. The Fibre Channel over Ethernet (FCoE) protocol is used to consolidate Ethernet and Fibre Channel traffic onto the same physical connection between the server and the switch. As a top-of-rack switch, all the servers in the rack connect to the Cisco Nexus 5010 switch, and it connects to the LAN or SAN.

The Cisco Nexus 5010 switch is a part of a family of switches that provide 10-Gigabit Ethernet and FCoE ports and both 10-Gigabit Ethernet and native 1-, 2-, and 4-Gbps Fibre Channel ports. The switches provide consolidated I/O connectivity to both production Ethernet LANs and Fibre Channel SANs in a cost-effective, high-performance, low-latency Ethernet switch.

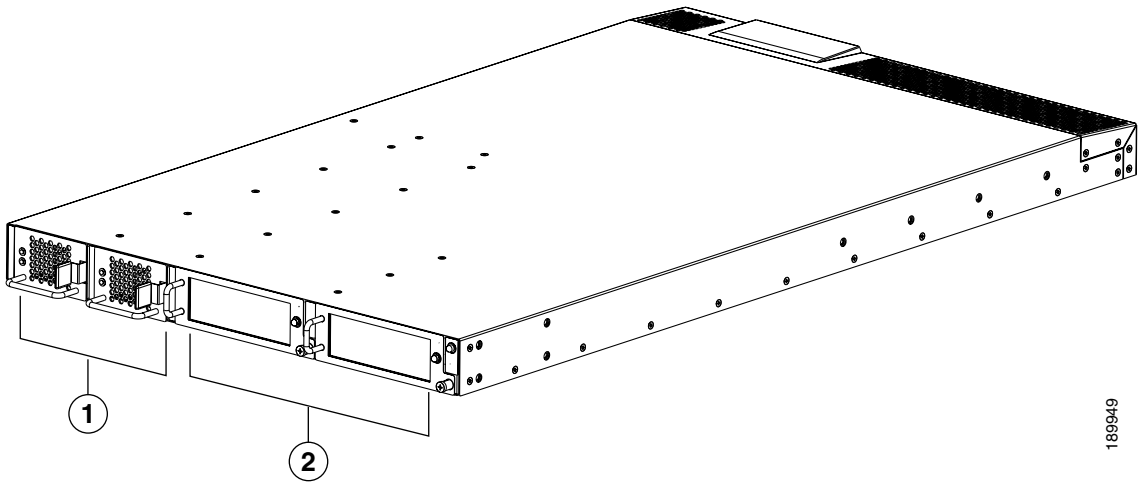
The Cisco Nexus 5010 switch has the following features:

- One slot on the back of the switch for an optional uplink Gatos Expansion Module [GEM]. The following modules can be inserted into this slot: N5K-M1404, N5K-M1600 and N5K-M1008.
- Twenty to twenty-eight ports on the back of the switch depending on which GEM is installed. Twenty ports on Cisco Nexus 5010 switch belong to the base switch. Additionally, you an insert a a module with six or eight ports.
- Two slots on the front of the switch for hot swap-capable power supplies.
- Two slots on the front of the switch for fan modules. Each fan module houses six fans. The combination of six fans per module and two modules provides the switch with a total of 12-fans.

Chassis

The Cisco Nexus 5010 chassis is 1 RU, 1.72 inches tall, 17.3 inches wide and 30.0 inches deep. It is designed to be mounted in a standard 19-inch rack. The switch has two power supplies and two fans modules on the front of the switch. Ports are at the rear of the switch. The airflow is front to back. Figure 2-19 shows the front view of the Cisco Nexus 5010 switch.

Figure 2-19 Cisco Nexus 5010 Switch Front View



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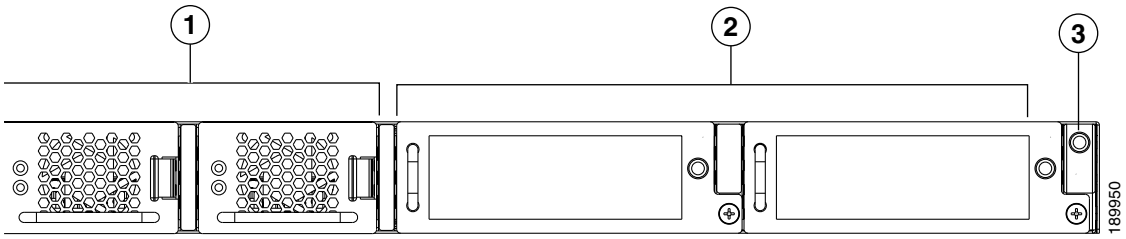
1	Two power supplies	2	Two fan modules

Figure 2-20 shows a close-up view of the front of the switch.

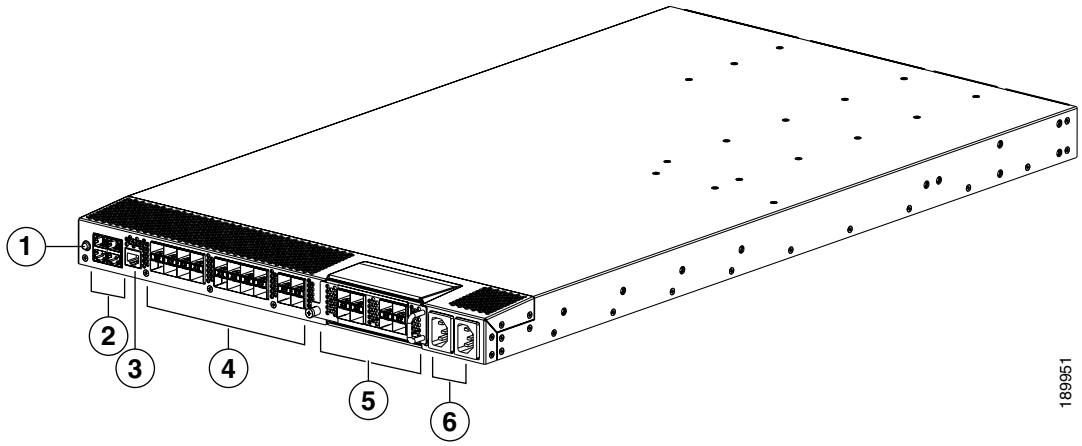
Figure 2-20 Cisco Nexus 5010 Switch Front View Close-up



1	Two power supplies	3	System status LED
2	Two fan modules		

The rear of the Cisco Nexus 5010 chassis has 20 fixed 10-Gigabit Ethernet ports, 1 slot for an optional expansion module, an Ethernet connector with 2 cross-connect ports and 2 management ports, a console port, and 2 AC power connectors. Figure 2-21 shows the rear of the Cisco Nexus 5010 switch.

Figure 2-21 Cisco Nexus 5010 Switch Rear View



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1	System status LED	**4**	20 fixed 10-Gigabit Ethernet ports
2	Ethernet connector with two cross-connect ports on the left (top and bottom), and two network management ports on the right (top and bottom)	**5**	Expansion modules
3	Console port	**6**	AC power connectors

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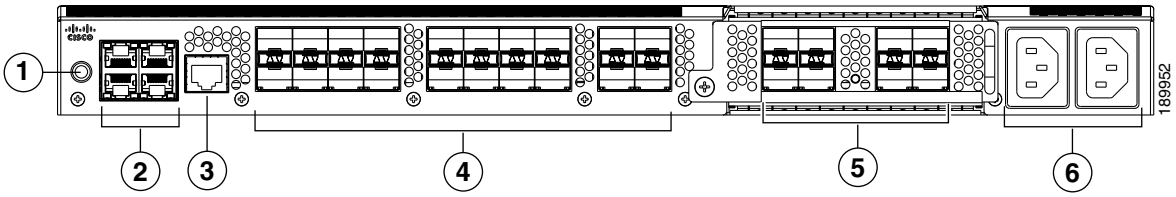
Figure 2-22 shows a close-up view of the rear of the Cisco Nexus 5010 chassis.

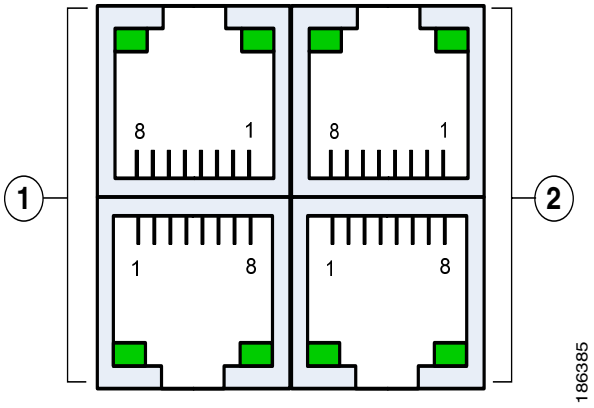
Figure 2-22 Cisco Nexus 5010 Switch Rear View Close-up



1	System status LED	**4**	Slot 1, with 20 fixed 10-Gigabit Ethernet ports (highlighted in red).
2	Ethernet connector with two cross-connect ports on left side and two network management1 (top) and management2 (bottom) ports on the right side	**5**	Slot 2 for an optional expansion module
3	Console port	**6**	AC power connectors

The Ethernet connector port exposes four Ethernet ports that are in a 2x2 stacked RJ-45 jack. Figure 2-23 shows a close-up view of the Ethernet connector port.

Figure 2-23 Ethernet Connector Port



1	Internal cross connect ports	**2**	Network management ports

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Table 2-7 lists the LED descriptions for all Ethernet LEDs.

Table 2-7 Ethernet LED Descriptions

LED	Status	Description
Left	Off	No link
	Solid green	Physical link
Right	Off	No activity
	Blinking green	Activity

Expansion Modules

Expansion modules allow Cisco Nexus 5000 switches to be configured as cost-effective 10-Gigabit Ethernet switches and as I/O consolidation platforms with native Fibre Channel connectivity. The Cisco Nexus 5010 switch has one slot for an optional uplink Gatos Expansion Module (GEM). The following modules can be inserted in this slot: N5K-M1404, N5K-M1600, N5K-M1008 and N5K-M1060.

- N5K-M1404 provides 4 10G SFP+, and 4 Fiber Channel 1/2/4G SFP based uplink connections. The 10-Gigabit Ethernet ports are encryption capable.
- M5K-M1600 provides 6 10G SFP+ based uplink connections.
- N5K-M1008 provides 8 1-, 2-, and 4- Gps Fiber Channel, SFP based uplink connection.
- N5K-M1060 provides 6 1-, 2-, 4-, and 8-Gbps line rate Fiber Channel, SFP+ based uplink connections.

The chassis supports hot swapping of the expansion modules.

This section includes the fllowing topics:

- N5K-M1404 Gatos Expansion Module, page 2-22
- N5K-M1600 Gatos Expansion Module, page 2-23
- N5K-M1008 Gatos Expansion Module, page 2-24
- N5K-M1060 Gatos Expansion Module, page 2-25

N5K-M1404 Gatos Expansion Module

The N5K-M1404 GEM supports four SFP+ transceiver modules and four 1-, 2-, 4-Gbps Fibre Channel transceivers. The N5K-M1404 Fibre Channel plus Ethernet expansion module is a field-replaceable unit (FRU). Figure 2-24 shows the Fibre Channel plus Ethernet expansion module.

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Figure 2-24 N5K-M1404 Gatos Expansion Module

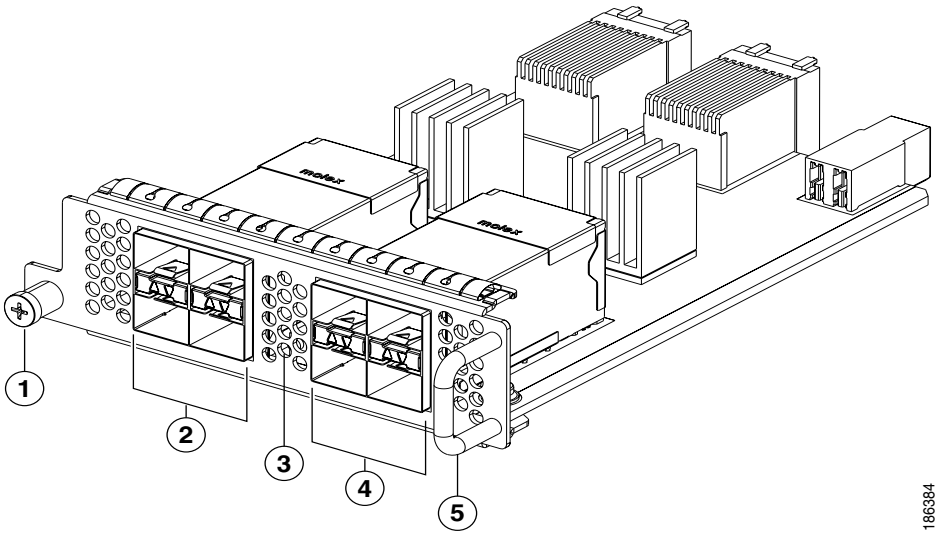
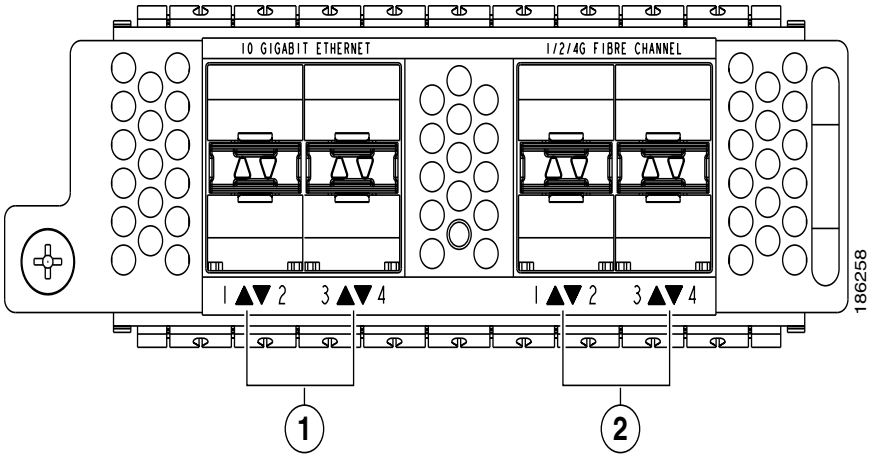


Figure 2-25 shows the front of the N5K-M1404 GEM . Figure 2-13 shows how ports are numbered on the GEM.

Figure 2-25 Front of the N5K-M1404 GEM



1	Four 10-Gigabit Ethernet ports	**3**	Four 1-, 2-, 4-Gbps Fibre Channel ports
2	Module LED		

N5K-M1600 Gatos Expansion Module

The N5K-M1600 GEM supports 6 10G SFP+ based uplink connections. Figure 2-26 shows the N5K-M1600 GEM.

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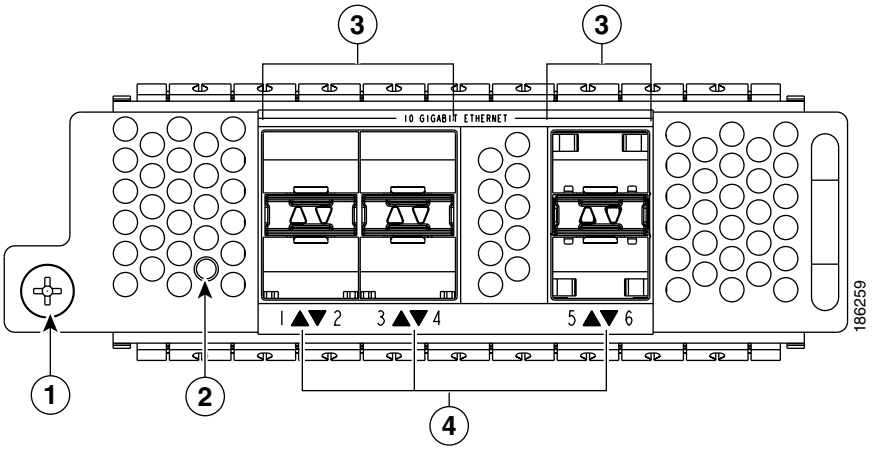
Figure 2-26 N5K-M1600 GEM



1	10-Gigabit Ethernet ports	**3**	10-Gigabit Ethernet ports
2	Module LED		

See Figure 2-14 for an illustration of how ports are grouped and numbered on the Ethernet expansion module.

N5K-M1008 Gatos Expansion Module

The N5K-M1008 GEM supports 8 1/2/4G Fiber Channel, SFP-based uplink connection. Figure 2-27 and Figure 2-28 show the N5K-M1008 GEM.

Figure 2-27 N5K-M1008 GEM

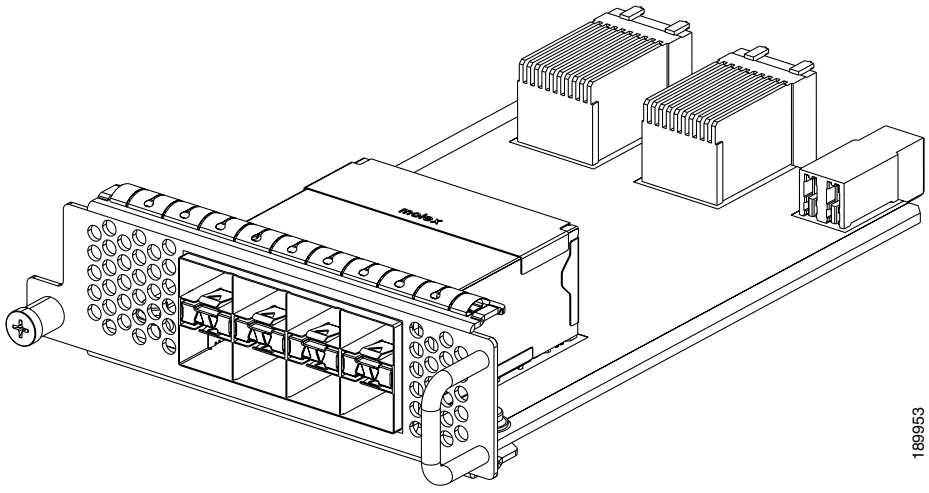


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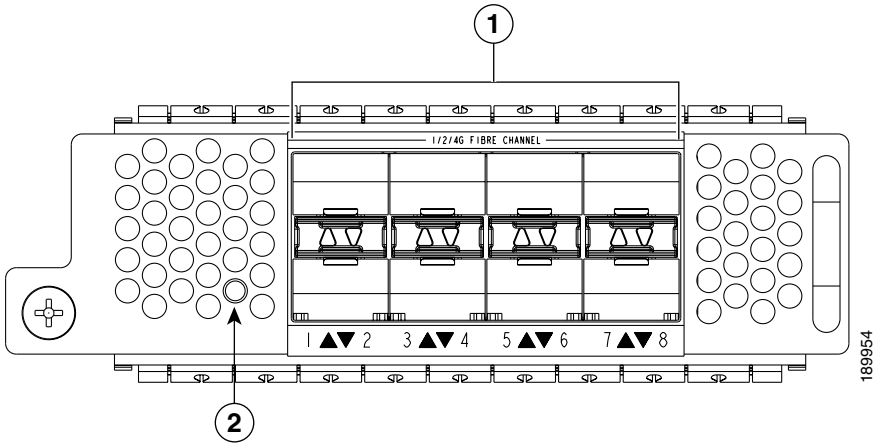
Figure 2-28 Front View of the N5K-M1008 GEM



1	Eight 1-, 2-, 4-Gbps Fibre Channel ports	2	LED

N5K-M1060 Gatos Expansion Module

The N5K-M1060 expansion module provides 6 EA 1-, 2-, 4-, 8-Gbps line rate Fiber Channel, SFP+ based uplink connections. Figure 2-27 shows the N5K-M1060 GEM.

Figure 2-29 N5K-M1060 GEM

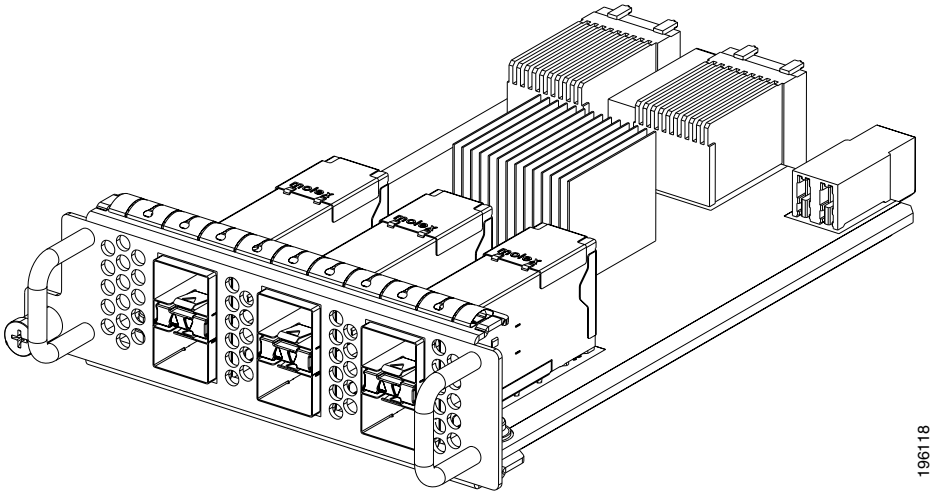


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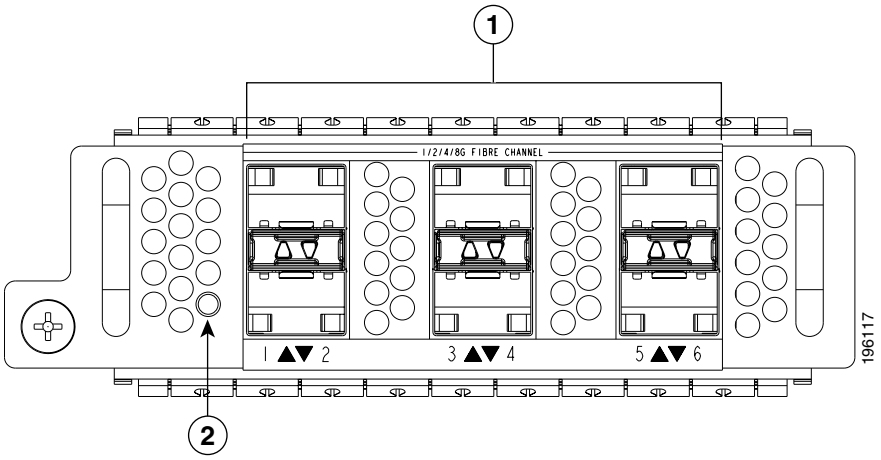
Figure 2-30 Front of the N5K-M1060 GEM



1	Six 1-, 2-, 4-, 8-Gbps Fibre Channel ports	2	LED

Ports

Each individual port on the Cisco Nexus 5010 switch is numbered, and groups of ports are numbered based on their function. The ports are numbered top to bottom and left to right.

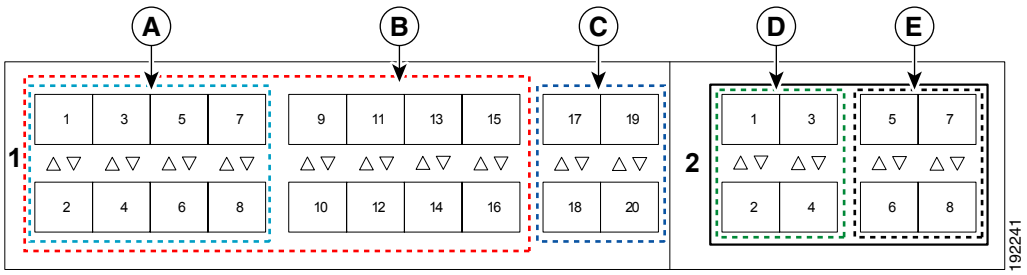
There are 20 to 28 ports on the Cisco Nexus 5010 switch, depending on which GEM is installed.

The 20 fixed ports form group 1 and are named 1/*port_number*. Ports 1 through 16 are unencrypted Ethernet ports. Of these, ports 1 through 8 are 10-Gigabit Ethernet and 1-Gigabit Ethernet-capable ports. Ports 17 through 20 are encryption-capable Ethernet ports.

Group 2 includes the ports in the GEM module. Group 2, ports 1 through 4, are encrypted Ethernet ports. Group 2, ports 5 through 8, are Fibre Channel ports.

Figure 2-31 shows how ports are numbered and grouped by function with the N5K-M1404 GEM installed.

Figure 2-31 Port Numbering of the Cisco Nexus 5010 Switch with the N5K-M1404 GEM



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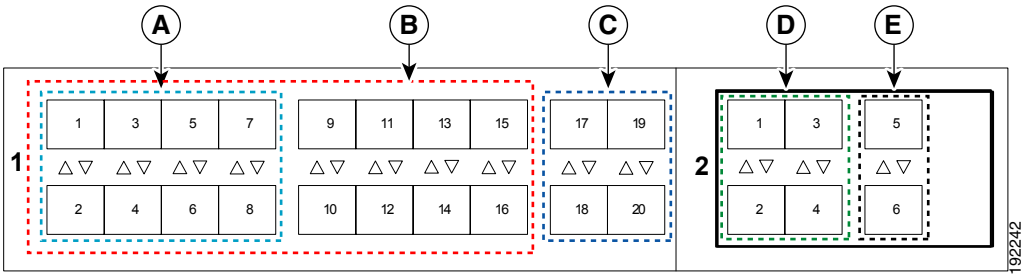
A	Group 1, ports 1 through 8: 10-Gigabit Ethernet and 1-Gigabit Ethernet capable unencrypted ports	**D**	Group 2, ports 1 through 4: Encrypted Ethernet ports
B	Group 1, ports 1 through 16: Unencrypted Ethernet ports	**E**	Group 2, ports 5 through 8: Fibre Channel ports
C	Group 1, ports 17 through 20: Encrypted Ethernet ports		

Figure 2-32 shows how ports are numbered and grouped by function with the N5K-M1600 GEM installed.

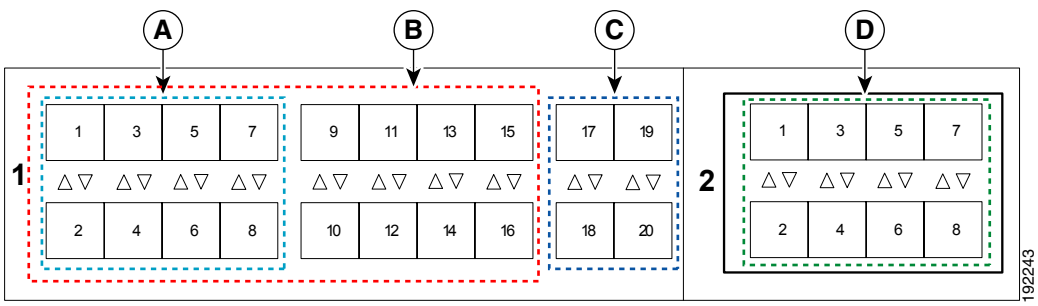
Figure 2-32 Port Numbering of the Cisco Nexus 5010 Switch with the N5K-M1600 GEM



A	Group 1, ports 1 through 8: 10-Gigabit Ethernet and 1-Gigabit Ethernet capable unencrypted ports	**D**	Group 2, ports 1 through 4: Encrypted Ethernet ports
B	Group 1, ports 1 through 16: Unencrypted Ethernet ports	**E**	Group 2, ports 5 and 8: Unencrypted Ethernet ports
C	Group , ports 17 through 20: Encrypted Ethernet ports		

Figure 2-33 shows how ports are numbered and grouped by function with the N5K-M1008 GEM installed.

Figure 2-33 Port Numbering of the Cisco Nexus 5010 Switch with the N5K-M1008 GEM



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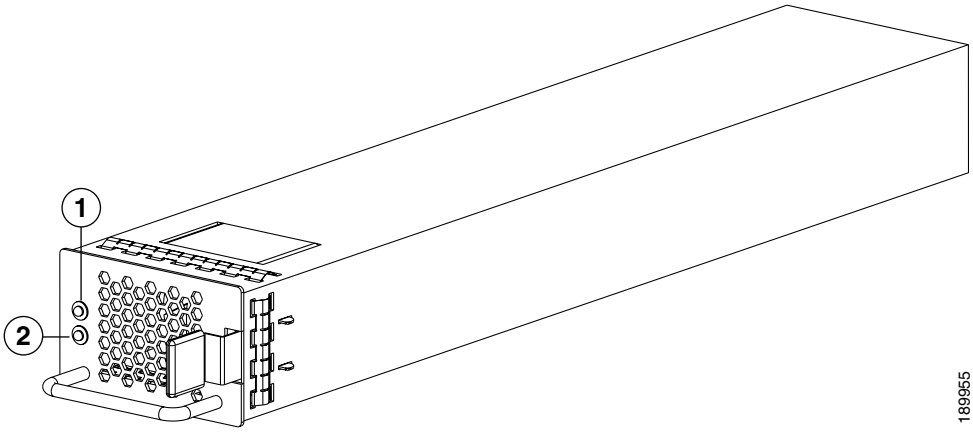
A	Group 1, ports 1 through 8: 10-Gigabit Ethernet and 1-Gigabit Ethernet capable unencrypted ports	**D**	Group 2, ports 1 through 8: Fibre Channel ports
B	Group 1, ports 1 through 16: Unencrypted Ethernet ports		
C	Group 1, ports 17 through 20: Encrypted Ethernet ports		

Power Supplies

The Cisco Nexus 5010 switch uses a front-end power supply. The chassis has slots for two power supplies. Two power supplies can be used for redundancy, but the Cisco Nexus 5010 switch is fully functional with one power supply. Figure 2-34 shows the power supply, which has two LEDs: one for power status and one for failure condition.

Figure 2-34 Power Supply for the Cisco Nexus 5010 Switch



1	Amber fail LED indicates a failure condition.	**2**	Green power LED indicates the power status.

Table 2-8 table describes the status of the two power supply LEDs.

Table 2-8 Power Supply LED Descriptions

Power Supply Condition	Power LED Status	Fail LED Status
No AC power to all power supplies.	Off	Off
Power supply failure, including overvoltage, overcurrent, overtemperature, and fan failure.	Off	On

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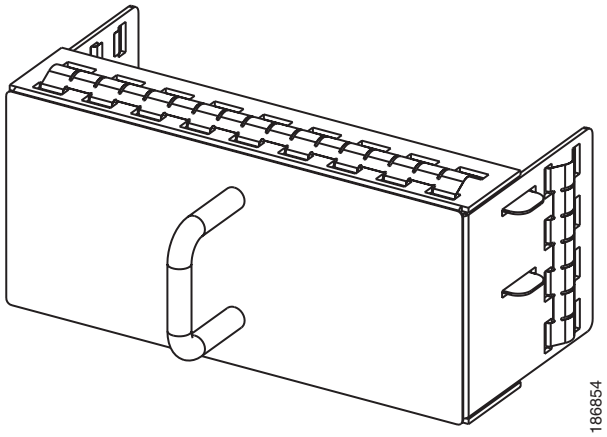
Table 2-8 Power Supply LED Descriptions (continued)

Power Supply Condition	Power LED Status	Fail LED Status
Power supply warning events where the power supply continues to operate. These events include high temperature, high power, and slow fan.	Off	Blinking
AC present, 3.3 voltage standby (VSB) on, and the power supply unit is off.	1 Hz blinking	Off
Power supply on and OK.	On	Off

If you haveone power supply installed in the chassis, but the other power supply slot is empty, you should use a blank filler panel to cover the empty slot. Figure 2-35 shows a blank power supply filler panel.

Figure 2-35 Blank Power Supply Filler Panel



Fan Modules

The Cisco Nexus 5010 switch has slots for two fans modules. Each fan module houses six fans. If you insert 2 fan modules (with 6 fans in each module), your switch will have a total of 12 fans. Figure 2-36 shows the fan module.

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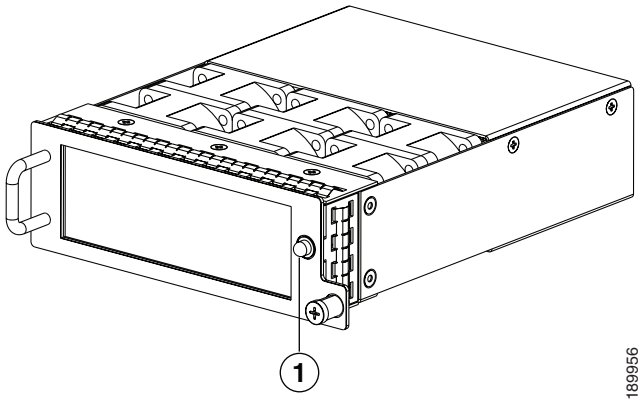
Figure 2-36 Cisco Nexus 5010 Fan Module



1	Fan module LED		

The bicolor fan module LED indicates the fan tray health. Green indicates normal operation, while amber indicates a fan failure.

LED Descriptions

Table 2-9 describes the LEDs for the Cisco Nexus 5010 switch.

Table 2-9 LEDs for the Cisco Nexus 5010 Switch

LED	Location	Function	Color	Status	Description
Power LED	Front of Chassis	Chassis Power/ Health	Green	Solid On	System is and on operation normally
				Off	Switch is powered off
			Amber	On	Fault condition
Fan Tray Status	Fan trays (front)	Fan tray heath indicator (multicolor)	Green	Solid On	Fan tray operating normally
			Amber	Solid On	Fan failure within the fan tray

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Table 2-9 LEDs for the Cisco Nexus 5010 Switch (continued)

LED	Location	Function	Color	Status	Description
PSU Status Indicators	Power supply (front)	PSU Health (multi color)	Green	OFF	No AC power to power supply
				Solid On	Power supply on and OK
			Amber	Solid On	Power supply failures, overvoltage, overcurrent, overtemperature
				Blinking	AC present, 3.3 VSB on, PSU is off
				OFF	Operating normally
GEM Health Indicator	Back of chassis	An indicator to show there is a fault with any one of the GEMs	Green	On	GEM is operating normally
			Amber	Solid on	A fault has occurred on the GEM.

Port Level LEDs

There are 20 to 26 port activity LEds on the switch depending on whether the GEM is a Fibre Channel or 10-Gigabit Ethernet module. Table 2-10 describes the behavior of the port LEDs.

Table 2-10 Port Level LEDs

Link State	LED State	Notes
Link Down	OFF	—
POST failed on port	AMBER blinking yellow	—
Administrative disabled	AMBER_ON	Depending on the product you look at, the LED could be off, or solid amber
Link Up, port in STP forwarding state	GREEN_ON	Blinks based on network activity

Supported SFP Transceivers

The Cisco Nexus 5010 switch supports both SFP+ Ethernet transceivers and SFP Fibre Channel transceivers.

This section includes the following topics:

- SFP+ Transceivers, page 2-32
- SFP+ Copper Cables, page 2-32
- SFP Fiber Channel Transceivers, page 2-32

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SFP+ Transceivers

The enhanced Small-Form-Factor Pluggable (SFP+) 10-Gigabit Ethernet transceiver module is a bidirectional device with a transmitter and receiver in the same physical package. SeeTable 2-11. It has a 20-pin connector on the electrical interface and duplex LC connector on the optical interface.The Cisco Nexus 5010 switch supports the following SFP+ optical transceivers:

- SR
- DCR, SR-Lite (shorter reach than SR)
- LRM (for uplink only)
- LR (for uplink only)

Table 2-11 SFP+ Transceivers

Model	Description
SFP-10G-SR	10-Gigabit Ethernet—Short range SFP+ module
SFP-10G-LR	10-Gigabit Ethernet—Long range SFP+ module

SFP+ Copper Cables

Copper cables are available for use with the 10-Gigabit Ethernet SFP+ module. SeeTable 2-12. The cables come in the following lengths:

- 1m, 30AWG
- 3m, 28-30 AWG
- 5m, 26-28 AWG

Table 2-12 SFP+ Copper Cables

Model	Description
SFP-H10GB-CU1M	10GBASE-CU SFP+ cable (1 meters)
SFP-H10GB-CU3M	10GBASE-CU SFP+ cable (3 meters)
SFP-H10GB-CU5M	10GBASE-CU SFP+ cable (5 meters)

SFP Fiber Channel Transceivers

The Cisco Nexus 5010 switch supports the multimode 850nm 4Gbps SFP with 150m reach. See Table 2-13.

Table 2-13 SFP Fiber Channel TransceiverS

Model	Description
DS-SFP-FC4G-SW	4 Gbps Fibre Channel-SW SFP, LC
DS-SFP-FC4G-LW	4 Gbps Fibre Channel-LW SFP, LC, (10 km reach)